

Orange County Sanitation District Technology Demonstration Project Update



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Objectives

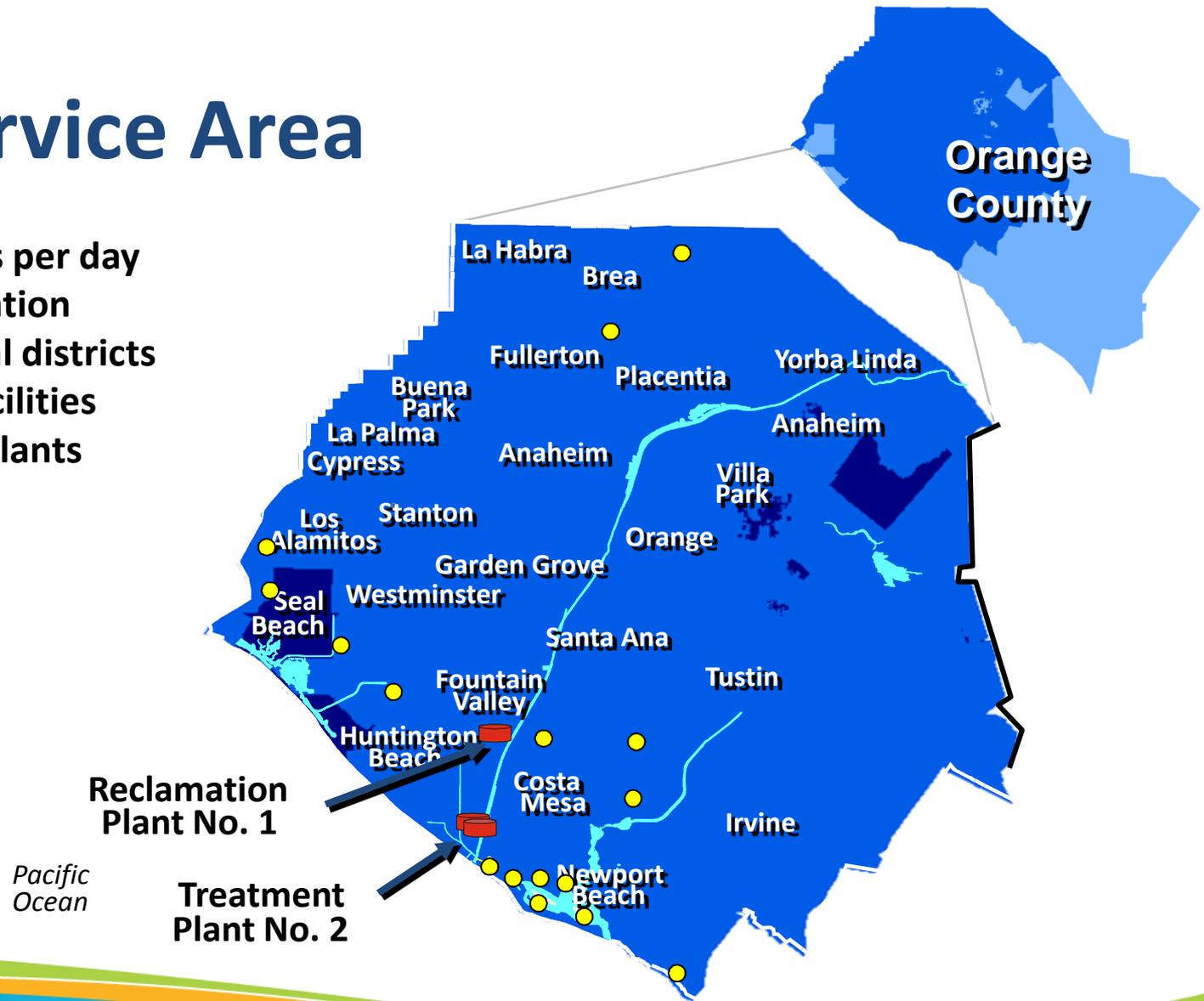
Rule 1110.2 Technology Implementation

- Where we have been
- Where we are now
- Where we are going next



OCSD Service Area

- 471 square miles
- 207 million gallons per day
- 2.5 million population
- 21 cities, 3 special districts
- 15 ● pumping facilities
- 2 ■ treatment plants



Central Power Generation Facilities

Plant No. 1 – Fountain Valley

- 3 identical IC engines
- 3471 hp each
- Lean burn
- 2500 kW generator
- Total nameplate capacity:
7.5 MW

Plant No. 2 – Huntington Beach

- 5 identical IC engines
- 4166 hp each
- Lean burn
- 3000 kW generator
- 1 MW steam turbine
- Total nameplate capacity:
16 MW

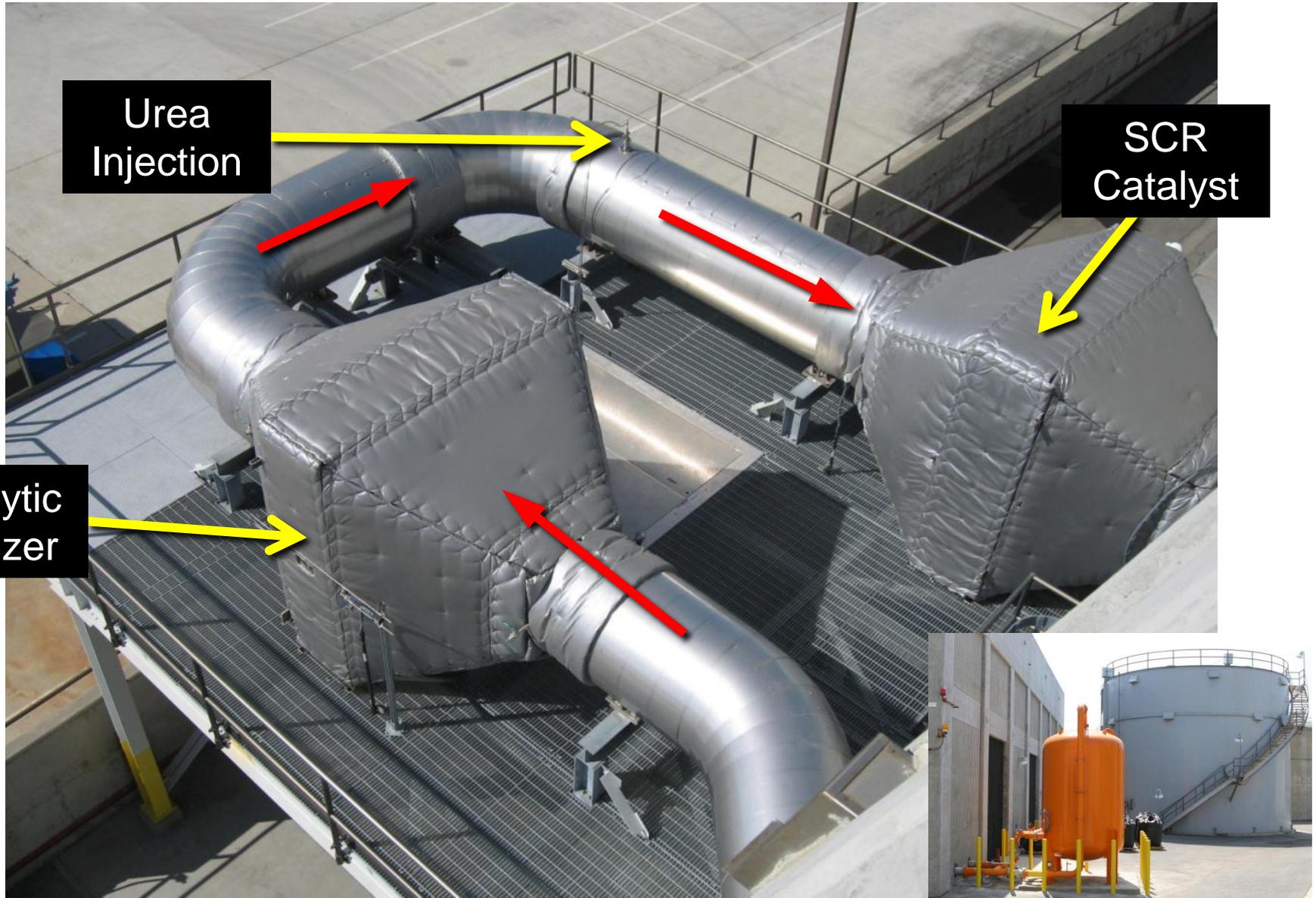
Both plants combined: 1.4 billion cubic feet of digester gas produced in 2013

Rule 1110.2 Impacts OCSD Resource Recovery Operations Significantly

- 55 biogas engines in South Coast basin
- 27 are digester gas fueled
- OCSD operates 8 of those 27



Catalytic Oxidizer/SCR System



SCR Urea Injection Control Panel and Urea Tank



One-Year Technology Demonstration

- ✓ *Demonstration monitoring conducted from April 1, 2010 to March 31, 2011*
- ✓ *Over 21,000 data points recorded (more than 5000 engine operating hours)*
- ✓ *Final report submitted to SCAQMD in July 2011*

Technology Demonstration Project

Emissions Levels Achieved

Pollutant	Engine Exhaust w/o Catalysts (ppmv)	Engine Exhaust With Catalysts (ppmv)	Rule 1110.2 limit (ppmv)
NOx	31	7.2 (0.8 to 21.8)	11
CO	452	7.5 (4.0 to 42.2)	250
VOC	97	3.6 (0.73 to 5.42)	30

15-minute averages. Validated data only. Excludes exceedances during engine start-up (30 minutes) and due to operational issues/systems adjustments.

Recent CEMS Data

November - May 2014:

8.3 ppm NO_x

7.5 ppm CO

11.5 ppm VOC (not CEMS)

7.4 ppm NH₃ slip (calculated)

2.1 ppm NH₃ slip (measured)



Our Learning Continues

More than **27,000** operating hours later – still using original catalysts

Catalyst performance degradation in February 2012

✓ catalyst cleaned and put back into service

Continuous siloxane monitoring investigated

✓ expensive, maintenance requirements unknown

What is a good indicator of contaminant breakthrough in gas cleaning unit that we can readily test for?

✓ ongoing

Full Implementation: Project J-111

- Project includes gas cleaning units with primary/polishing configuration and Cat Ox/SCR systems for all eight of OCSD's co-generation engines.
- RFP for construction went out Dec 27th 2013
- Construction contract approved by OCSD Board of Directors on April 23rd 2014
- Notice to Proceed was May 27, 2014 (yesterday)



All Engines Will Not Meet Deadline



- 1/8/2016
 - One engine complete at Plant1
 - Two engines complete at Plant 2
- 5/17/2016
 - Substantial completion of all 8 engines

Rule 1110.2 (d)(1)(H)(ii)

Rule 1110.2 (Cont.)

(Amended September 7, 2012)

interval averaging time for the first 4 months of the retrofitted engine's operation and up to a 24 hour fixed interval averaging time thereafter. For purposes of determining compliance using a longer averaging time:

- (i) An operator shall not average data during one-minute periods in which the underlying equipment is not operated or when the CEMS is undergoing zero or calibration checks, cylinder gas audits, or routine maintenance in accordance with the provisions in Rules 218 and 218.1.
- (ii) Notwithstanding the requirements of Rules 218 and 218.1, for one-minute time periods where NO_x and/or CO CEMS data are greater than 95 percent of the Rule 218.1 Full Scale Range while the underlying equipment is operating, an operator shall use substitute data. A concentration equivalent to 3 times the NO_x and/or CO emission limits in Table III-B (each corrected to 15% O₂) shall be used as substitute data.



Thank You

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